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14

SYLLABUS

OF

THE COURSE OF LECTURES

ON

BOTANY,

DELIVERED IN COLUMBIA COLLEGE,

✓
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1814.

*At a meeting of the Trustees of Columbia College, held at
the College Hall, on Monday, the ninth day of July, 1792,*

ORDERED, That every Professor of this College who teaches
by Lecture, do publish, within one year, a Syllabus of his Course
of Lectures.

Extract from the Minutes,

ROBERT HARPUR, Clk.

At the request of a number of students of medicine, the present Syllabus of the Course of Lectures on Botany, delivered for a series of years in Columbia College, while the author held the professorship of botany in that institution, is reprinted. It is republished from the copy drawn up and printed in 1795.-

SYLLABUS, &c.

PART I.

STRUCTURE AND FUNCTIONS OF VEGETABLES.

A.

GENERAL DIVISION OF NATURAL HISTORY.

| | | | |
|---------------|---------------------|-------------|-------------|
| 1 METEOROLOGY | } History of the | ATMOSPHERE, | } kingdoms. |
| 2 HYDROGRAPHY | | WATERS, | |
| 3 GEOLOGY | | EARTH, | |
| 4 ZOOLOGY | | ANIMAL | |
| 5 BOTANY | | VEGETABLE | |
| 6 MINERALOGY | | MINERAL | |

—Division of bodies into *animal—vegetable*, and *mineral*, considered—objections to—

Opinions of *Tournefort*, *Linnaeus*, &c. examined.—

Minerals—characters which distinguish them from animals and vegetables—

Vegetables—their near approach to the animal kingdom—

Distinctions proposed by

JUNGIUS,
BOERHAAVE,
TOURNEFORT,
LUDWIG,
LINNÆUS,
ALSTON,
HEDWIG, &c.

Corals and *Zoophytes*, referred by some authors to the vegetable and fossil kingdoms—their *animal* nature illustrated by the discoveries of *Peyssonnet*, *Trembley*, *Jussieu*, *Donati*, *Ellis*, &c.—

B.

COMPARISON OF PLANTS AND ANIMALS.

- 1 Their origin.
 - 2 Growth and manner of receiving nourishment.
 - 3 Food.
 - 4 Climate.
 - 5 Secretion and excretion.
 - 6 Sensation—volition—motion—sleep—watching.
 - 7 Sexes.
 - 8 Propagation.
 - 9 Diseases.
 - 10 Death.
 - 11 Natural decomposition.
 - 12 Chemical Analysis.
- CONCLUSION—Animals and Vegetables, links of the same chain of being—objections to, by some Metaphysicians, considered.

C.

GENERAL ARRANGEMENT OF VEGETABLES.

- 1 Palms.
- 2 Trees.
- 3 Shrubs.
- 4 Herbs.
- 5 Grasses.
- 6 Ferns.
- 7 Fungi.
- 8 Mosses.
- 9 Algæ.

—Characters of each illustrated.—

D.

COMPONENT PARTS OF A PLANT.

- 1 Root.
- 2 Trunk.
- 3 Branches.
- 4 Leaves.

- 5 Supports.
- 6 Flower.
- 7 Fruit.

—Exceptions to—

E.

ANATOMY OF PLANTS.

A.—SOLIDS.

- 1 Epidermis.
 - 2 Rete Mucosum.
 - 3 Cortex—its inner layer **LIBER**—
 - 4 Alburnum.
 - 5 Lignum.
 - 6 Medulla.
 - 7 Vasa Propria.
 - 8 Tracheæ, or air vessels—have no existence.—
- Structure and functions of plants illustrated by dissection and experiment—

B.—FLUIDS.

(a.)—NUTRITIOUS FLUIDS.

- 1 Lymph.
- 2 Sap.

—Circulation of the sap disproved—doctrine of the Ancients—**experiments** of **HALES, HOPE, WALKER, &c.**

(b.)—SECRETED FLUIDS.

- 1 Gums.
- 2 Resins.
- 3 Gum Resins.
- 4 Balsams.
- 5 Oils—fixed and volatile.
- 6 Aroma—grateful and poisonous.
- 7 Water.
- 8 Vital air.

C.—ANOMALOUS SUBSTANCES.

1 Saline Substances.

- i Sugar,
- ii Manna,
- iii Nectar,

2 Farina,

3 Fæcula,

4 Colouring Matter.

—Observations on colours, and the principles of dyeing.—

F.

CHEMICAL ANALYSIS OF VEGETABLES.

| | | |
|---------------|---|-------------------------------------|
| 1 Oxygen, | } | Common to all vegetables* |
| 2 Hydrogen, | | |
| 3 Carbon, | | |
| 4 Nitrogen, | } | Contained in particular vegetables† |
| 5 Phosphorus, | | |
| 6 Sulphur, | | |
| 7 Acids, | | |
| 8 Alkalis, | | |
| 9 Earths, | | |
| Metals, | | |

G.

FOOD OF PLANTS:

- 1 Air,
- 2 Water,
- 3 Earth,
- 4 Heat,
- 5 Light.

—All necessary to the perfect growth of plants—illustrated by experiments and observations.—

—Experiments of VAN HELMONT,

BOYLE,

HALES,

DU HAMEL,

TILLET,

HASSENFRATZ,

SENEBIER, &c.—

—Chemical Analysis of the *food* of plants compared with the Chemical Analysis of *plants*.—

H.

SOILS.

- 1 Variety.
- 2 Composition.
- 3 Manner of Operation.

I.

MANURES.

- 1 Animal.
- 2 Vegetable.
- 3 Mineral.
- 4 Electricity.

—Operation of Manures—how far useful or injurious.—

K.

OF THE SEED.

A.—DIFFERENT KINDS.

- 1 Seed properly so called.
- 2 Nux.
- 3 Propago.

B.—COMPONENT PARTS OF THE SEED.

- 1 Arillus,
- 2 Hilum,
- 3 Foramen,
- 4 Cotyledon,
- 5 Corculum,
 - i Plumula,
 - ii Radicula,
- 6 Corona,
- 7 Ala.

—Structure and Functions of each illustrated by dissection and experiments.

C.—VEGETATION OF THE SEED.

- | | | |
|-----------------|---|---|
| 1 Impregnation. | } | Necessary to Vegetation. |
| 2 Air. | | |
| 3 Moisture. | | |
| 4 Heat. | | |
| 5 Light, | } | Not essential to the first growth of the Seed. |
| 6 Earth, | | |
- Experiments of CURTIS, &c.—process of Vegetation described.

D.—PROPAGATION.

(a.)—NATURAL PROPAGATION.

- 1 Seeds.
- 2 Roots.
- 3 Suckers.
- 4 Stems.
- 5 Bulbs.
- 6 Leaves.

(b.)—ARTIFICIAL PROPAGATION

- 1 Cutting.
- 2 Layers.
- 3 Engrafting.
- 4 Inoculation.

—Structure of Buds—

—Equivocal generation, objections to—

I.

OF THE ROOT.

A.—DIFFERENCE OF STRUCTURE AND SHAPE.

- 1 Bulbous.
- 2 Tuberous.
- 3 Fibrous.

B.—MANNER OF GROWTH.

- 1 Creeping.
- 2 Horizontal.
- 3 Perpendicular.

C.—DURATION.

- 1 Annual.
- 2 Biennial.
- 3 Perennial.

—Exceptions from Culture, Climate, &c.

M.

OF THE TRUNK.

A.—DIFFERENT KINDS.

- 1 Caulis.
- 2 Culmus.
- 3 Scapus.
- 4 Frons.
- 5 Stipes.

B.—DIFFERENT SPECIES ARISING FROM—

- 1 Structure.
- 2 Height.
- 3 Direction.
- 4 Shape.
- 5 Surface.
- 6 Composition.
- 7 Branches.
- 8 Colour.

—Illustration.—

N.

OF THE LEAVES.

A.—COMPONENT PARTS OF A LEAF.

(a.)—FOLIUM.

- 1 Its base.
- 2 Apex.
- 3 Surfaces.
- 4 Parenchyma.

(b.)—PETIOLUS.

- 1 Its shape.
- 2 Length.
- 3 Insertion.
- 4 Direction.
- 5 Surface.

B.—SIMPLE LEAVES.

- 1 Place of insertion.
- 2 Manner of insertion.
- 3 Relative situation.
- 4 Direction.
- 5 Shape.
- 6 Surface.
- 7 Length and expansion.
- 8 Substance.
- 9 Duration.—

C.—COMPOUND LEAVES.

--Degree of Composition.

--Illustration.—

D.—FUNCTIONS OF LEAVES.

- 1 Use in the vegetable economy as organs of respiration.
- 2 Influence upon the atmosphere.—

Experiments of MILLER,

HALES,

MARIOTTE,

BONNET,

DU HAMEL,

PRIESTLEY,

INGENHOUSZ,

SENEBIER.

O.

FULCRA, OR MORE PROPERLY APPENDAGES.

- 1 Stipulæ.
- 2 Bractææ.
- 3 Cirrhus.

- 4 Spini.
- 5 Aculei.
- 6 Pili.
- 7 Glandula.—

—Illustration.—

P.

ORGANS OF FRUCTIFICATION.

A.—PEDUNCULUS.

- 1 Its composition.
- 2 Place of insertion.
- 3 Relative situation.
- 4 Direction.
- 5 Structure.

B.—RECEPTACULUM.

- 1 Its composition.
- 2 Surface.

C.—CALYX.

- 1 Perianthium.
- 2 Involucrum.
- 3 Gluma.
- 4 Spatha.
- 5 Calyptra.
- 6 Volva.

Characters of each

- 1 Shape.
- 2 Number.
- 3 Divisions.
- 4 Number of pieces.
- 5 Situation.
- 6 Colour.
- 7 Duration.

D.—COROLLA

- 1 Its shape.
- 2 Regularity.

- 3 Divisions.
- 4 Number of pieces.
- 5 Place of insertion.
- 6 Colour.
- 7 Duration.—

E.—STAMINA.

(a.)—FILAMENTUM.

- 1 Its length.
- 2 Proportion.
- 3 Figure.
- 4 Number.
- 5 Connexion.
- 6 Insertion.

(b.)—ANTHERA.

- 1 Shape.
- 2 Number.
- 3 Disposition.
- 4 Structure.
- 5 Pollen.

E.—PISTILLUM.

(a.)—GERMEN.

- 1 Its situation.
- 2 Structure.

(b.)—STYLUS.

- 1 Shape.
- 2 Number.
- 3 Division.
- 4 Length.
- 5 Direction.

(c.)—STIGMA.

- 1 Shape.
- 2 Number.—

Seeds of plants—imperfectly known to the ancients—demonstrated by
 Linnæus—

Experiments of LINNÆUS,
 SMITH, &c.

Objections of—ALSTON—

—SMELLIE—

—SPALLANZANI—considered—

G.—PERICARPIUM.

- 1 Capsula.
- 2 Conceptaculum.
- 3 Siliqua
- 4 Legumen.
- 5 Drupa.
- 6 Pomum.
- 7 Bacca.
- 8 Strobilus.—

H.—SEED.

—(SEE K. PAGE 9.)

Q.

INFLORESCENCE.

- 1 Spadix.
- 2 Verticillus.
- 3 Capitulum.
- 4 Spica.
- 5 Panicula.
- 6 Amentum.
- 7 Racemus.
- 8 Fasciculus.
- 9 Umbella.
- 10 Cyma.
- 11 Corymbus.
- 12 Thyrsus.

—Illustration —

—Calendarium Floræ, &c. &c

PART II.

SYSTEMATIC ARRANGEMENT OF VEGETABLES.

A.

HISTORY OF BOTANY.

FIRST PERIOD.

I. STATE OF BOTANY AMONG THE GRECIANS.

| | | |
|--|-----------|-------|
| HIPPOCRATES, | 400 years | B. C. |
| THEOPHRASTUS—"Historia Plantarum"—500 plants | 320 | B. C. |

II. STATE OF BOTANY AMONG THE ROMANS.

| | | |
|--------------------------------|-----|-------|
| DIOSCORIDES—601 plants— | 70 | A. C. |
| PLINY—Compilation—1000 plants— | 74 | |
| GALEN— | 131 | |

- Destruction of the Roman Empire—
- Decline of Learning until the eighth century—
- Learning revived by the Arabians.—

III. STATE OF BOTANY AMONG THE ARABIANS.

- Translations and compilations from the Grecian and Roman writings—
- Decline of Learning until the fifteenth century—

SECOND PERIOD.

| | |
|---|------|
| —Age of Commentators and Translators, | 1500 |
| BRUNFELSUS—first accurate prints of plants, | 1532 |
| First public Botanic Garden at Padua, | 1533 |
| CONRAD GESNER—first Museum in Natural History—first suggested a systematic arrangement of plants into class—order—genus, and species, | 1560 |
| CAESALPINUS—improved the proposed classification of Gesner, | 1583 |
| F. COLUMNA—first copperplates—improved the genera of plants, and Botanic language, | 1592 |
| J. BAUHIN, "Historia Plantarum Universalis," | 1613 |
| CASPAR BAUHIN, "Pinax Theatri Botanici," 6000 plants—with synonyms of the ancients, | 1628 |

| | |
|--|------|
| PARKINSON—"Theatrum Botanicum," | 1640 |
| JUNGIUS—"Doctoscopiæ Physicæ Minores"—containing the first principles of Linnæan classification, | 1657 |
| SOCIETIES for promoting knowledge. | |
| Royal Society of London, | 1665 |
| Royal Academy of Sciences at Paris, | 1666 |
| GREW—"Anatomy of Plants," | 1671 |
| MALPIGHIIUS—"Anatomia Plantarum," | 1675 |
| RHEEDE—"Hortus Malabaricus," | 1676 |
| MORISON—"Historia Universalis Plantarum"—a new system of arrangement, | 1678 |
| RAY—"Methodus Plantarum Nova Synoptica," | 1682 |
| "Historia Plantarum Generalis," | 1686 |
| "Synopsis Methodi Stirpium Britannicarum," | 1690 |
| HERMAN, New System—"Flora Lugduno Batava," | 1690 |
| RIVINUS, New System, | 1690 |
| PLUMIER—"Description des plantes de L'Amérique," | 1693 |
| SIR HANS SLOANE—"Natural History of Jamaica," | 1696 |
| TOURNEFORT—New System—improved the genera— | 1697 |
| KÖMPFER—"Amœnitates Exoticæ." | 1712 |
| SCHEUCHZER—Agrostographia | 1719 |
| BOERHAAVE—New System, | 1710 |
| MAGNOL—New System, | 1720 |
| HALES—"Vegetable Statics," | 1727 |
| MICHELII—CRYPTOGAMIA, | 1729 |
| CATESBY—"Natural History of Carolina," &c. | 1731 |

THIRD PERIOD.

| | |
|---|------|
| LINNÆUS—Sexual System— | |
| "Fundamenta Botanica," | 1735 |
| "Species Plantarum," 1764. | |
| "Genera Plantarum," new edition by Schreber, 1789. | |
| "Systema Vegetabilium," 14th edition by Murray, 1734. | |
| Do. do. by Gmelin, in his "Systema | |
| Natura Linnæi," 1791. | |
| "Philosophia Botanica." | |
| "Amœnitates Academicæ," new edition, by Schreber, 1787. | |
| "Flora Lapponica," new edition, by Smith, 1792. | |
| "Prælectiones in Ordines Naturales," by Giseke, 1792. | |
| &c. &c. &c. | |
| DILLENIUS—"Historia Muscorum," | 1741 |
| RUMPHIUS—"Herbarium Amboinense," | 1741 |
| HALLER—"Stirpes Helveticæ." | 1742 |

| | |
|--|------|
| LUDWIG—"Insitutiones Regni Vegetabilis," | 1742 |
| CLAYTON—"Flora Virginica," | 1742 |
| GMELIN—"Flora Siberica," | 1747 |
| ALSTON—"Tyrocinium Botanicum," | 1753 |
| BONNET—"Recherches sur l'usage des feuilles," | 1758 |
| DU HAMEL—"Physique des Arbres." | |
| BERNARD DE JUSSIEAU—"Genera Plantarum secundum ordines naturales disposita." | 1759 |
| Do. new edition by Paulus Usteri, 1791. | |
| HUDSON—"Flora Anglica," | 1762 |
| ADAMSON—"Familles des Plantes," | 1763 |
| SIR JOSEPH BANKS, } | 1763 |
| DR. SOLANDER, } | |
| JACQUIN—"Historia Stirpium Americanarum." | 1763 |
| "Hortus Vindebonensis," 1770. | |
| "Flora Austriaca," 1773. | |
| FLORA DANICA. | 1766 |
| SCHREBER—"History of Grasses," | 1769 |
| SIR JOHN HILL—"Vegetable system," new system, | 1773 |
| AUBLET—"Guiana," | 1775 |
| CURTIS—"Flora Londinensis," | 1777 |
| "Observations on Grasses, 1790. | |
| "Botanical Magazine," 1793. | |
| "Observations on vegetation," &c. &c. &c. . | |
| LIGHTFOOT—"Flora Scotica," | 1778 |
| LA MARCK—"Flore Francoise"—new system— | 1778 |
| HEDWIG—"Cryptogamia," | 1782 |
| PALLAS—"Flora Rossica," | 1784 |
| L'HERETIER—"Geraniologia"—"Sertum Anglicum," | 1784 |
| THUNBERG—"Flora Japponica," | 1784 |
| MARSHALL—"Arbustum Americanum," | 1785 |
| DICKSON—"Cryptogamia," &c. &c. &c. | 1785 |
| WALTHER—"Flora Caroliniana," | 1788 |
| GÆRTNER—"De Fructibus et Seminibus plantarum." | |
| —New System, | |
| SMITH—"Reliquæ Rudbeckianæ," | 1788 |
| "Icones Plantarum hactenus ineditæ," 1789. | |
| "Icones Pictæ Plantarum Rariorum," 1790. | |
| "Spicilegium Botanicum, 1791." | |
| "Botany of New Holland," 1793, &c. &c. &c. | |
| ENGLISH BOTANY, | 1790 |
| WOODVILLE—"Medical Botany," | 1790 |
| Transactions of the Linnæan Society of London, | 1791 |
| MARTYN—"Flora Rustica,"—"Language of Botany," &c. &c. &c. | 1793 |

LINNÆAN ARRANGEMENT.

A.—ARTIFICIAL, OR SEXUAL SYSTEM.

—Divided into—

- 1 Classes.
- 2 Orders.
- 3 Genera.
- 4 Species.
- 3 Varieties.

—Characters of each—

(a.)—CLASSES FORMED FROM

- | | | |
|----------------------|---|-----------------|
| 1 The number | } | Of the Stamina. |
| 2 Place of insertion | | |
| 3 Proportion | | |
| 4 Connexion | | |
| 5 Disposition, &c. | | |

—Illustration—

(b.)—ORDERS FORMED FROM

- | | | |
|---------------------------------|---|------------------|
| 1 The number | } | Of the Pistilla. |
| 2 Fertility | | |
| 3 Situation | | |
| 4 Structure of the Pericarpium. | | |
| 5 Number | } | Of the Stamina. |
| 6 Connexion | | |
| 7 Disposition, &c. | | |

—Illustration—

(c.)—GENERA FORMED FROM THE ORGANS OF FRUCTIFICATION.

(d.)—SPECIES FORMED FROM

- 1 The Root.
- 2 Trunk.
- 3 Branches.

4 Leaves.

5 Fulera, &c.

(e.)—VARIETIES—THE EFFECTS OF CLIMATE, CULTURE, &c.

—Illustration—

—Alterations of the Linnæan System, proposed by Thunberg—Gmelin, &c.—

B.—NATURAL ORDERS OF LINNÆUS.

—Illustration—

C.

SYSTEM OF JUSSIEAU.

—Compared with the natural orders of Linnæus—

—Advantages of each.—

D.

—Plants useful in Diet—Medicine—Agriculture, &c. illustrated with practical observations—

E.

—Herbarium—advantages of—manner of preserving and arranging plants—

—CONCLUSION.—

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